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ABSTRACT

Students' verbatim comments reflect the enthusiasm toward writing which is generated by the course. The author discusses the course design, citing the texts used, including readings from master, technical report writers. Description of the curriculum leads progressively from textual analysis through the final phase in which students are urged to publish their own articles. (RL)

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An Engineering Report Writing Course That Works

A Professor of English and Humanistic Studies at Newark College of Engineering (A.B., Drew; A.M., Ed.D., Columbia) describes how a course in Report Writing is conducted and presents testimony of its practical value from students, graduates, and faculty colleagues.

By HERMAN A. ESTRIN

"Speaking of report writing, I thought you might like to know how valuable I feel the report-writing course was and how fortunate I was to be able to take it . . . I have heard many engineers comment as to how much they dislike writing any type of report and how sorry they were that they hadn't taken such a course.

"I will go so far to say that of all the non-technical courses that I took at college the one of greatest importance to me and to my job is Report Writing!"

THIS EXCERPT is from an unsolicited letter from an alumnus who took the required course for seniors in the Civil Engineering Department entitled "Engineering Report Writing." The course meets three hours a week for one semester.

To learn the techniques of report writing, students were assigned chapters in Ulman and Gould's *Technical Reporting Revised.* To supplement these discussions, the instructor assigned readings in his anthology *Technical and Professional Writing* (Harcourt, Brace and World). In this way, students read articles on technical writing which were expertly and interestingly written by engineers and scientists. From these readings students wrote a paper on "How Engineers Can Improve the Style of Their Writing."

Another project was to have students read the writings of the technical writers of the past. This assignment is based on Walter J. Miller's article "What Can the Technical Writer of the Past Teach the Technical Writer of Today," *IRE Transactions on Engineering Writing and Speech,* December, 1961. Such works as Agricola's "The Education of a Mining Engineer," Archimedes' "An Engineer Defends His City," Aristotle's "The Egg and The Chick," Biringuccio's "DeLa Pirotechnia," and Herodotus' "Flood Control" proved to the students that technical and scientific writing need not be dull and boring but can be interesting, informative, and picturesque.

From a two-page bibliography "Masterpieces of Science and Engineering Writing" students read a minimum of ten selections from Homer to Hoover and prepared written reports concerning such facets as biographical data, a description of content, the reasons why the selection is considered a "masterpiece," and the relevance of this selection to engineering problems in our modern society. In addition, each student prepared his own annotated bibliography on engineering and scientific writing. Students were encouraged to go to the library; to use the various indexes; to become acquainted with the diverse professional magazines; and to read articles that concerned style, semantics, editing, audienic level, illustrations, and composition. This assignment stressed the importance of writing succinct, intelligent summaries and bibliographic data. By the number of science and engineering magazines which published articles on the techniques and the improvement of technical writing, students learned that effective writing in the profession of engineering is both necessary and important.

Editing a technical report gives the student an objectivity to technical writing. It seems that a student cannot edit his own work because he is subjective about his own writing. He cannot be objective about finding his own mistakes in writing, language, and format. In addition, editing gives the report an appropriate audience and a direction—a fulfillment of the purpose of writing. The student editors must read these reports intensively and minutely. To show an over-view of report writing by other engineering students and to give students experiences in editing, the instructor required each student to edit at least three reports written by students in other departments —electrical, chemical, mechanical, and industrial. Most of the reports that were edited, students noted, showed an inability to state relevant points with clarity. These editors agreed that many errors were made on the format of the report because of a lack of proper training in the techniques of report writing and because of the knowledge that

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the instructor would read the report only for technical content. Comments made by students after they edited a report are as follows:

"This report lacked good sentence structure and an effective vocabulary. The student wrote immature sentences and misspelled many words. His style was too choppy because he used too many one-sentence paragraphs."

"The student could have improved this report if he used captions, figures, and indent tables numbers. His illustrations did not clarify his text and included irrelevant details. He overused the pronoun ***this*** *and the expressions* ***it is important*** *and* ***it is interesting.***"

"This report was well organized and logically presented. The sentences were varied and well constructed. The paragraphs were fully developed with specific details. The illustrations were carefully drawn and accurately numbered. This student wrote interestingly and correctly."

The preparation of a final report submitted to the Civil Engineering Department served as the culmination of the course. Class discussions covered the important techniques of report writing, especially the use of the outline, footnotes, letter of transmittal, bibliography, and other details relating to the format of the report. In addition, students were assigned pertinent selections in the anthology to enable them to become more mature in their style of writing and their fluency of effective expression. Some class time was spent in the library where the instructor was available for consultation concerning library research, methods, and resources. The Civil Engineering Department instructors aided the students to select appropriate subjects for research. Students submitted for approval their tentative outlines to the instructors of both departments. Some typical report titles are as follows: "The Control of Erosion on the New Jersey Coast," "The Design of Storm Water Drains," "Pollution in New York Harbor," Reservoir Silting," "The St. Lawrence Seaway," "Sea Level Canal at Panama." In this milieu, students were motivated in writing a report because the assignment was meaningful, purposive, and relevant. Also, at this point in their education they have had an extensive knowledge of their subject content in civil engineering, they are more knowledgeable in their use of library resources, and they realize the importance of effective expression and communication in writing. For these reasons the majority of the reports were excellently written both in content and in format. Each student received two grades on the report—one for the subject in civil engineering and one for English.

Outcomes

- **"I gained a store of knowledge and have gained confidence in my writing."**
- **"Before I took this course, it was difficult for me to write anything, but now I see that it can be done."**
- **"As a result of this new faith in my ability to write, I have submitted a manuscript for publication and received a letter stating that it will be published within the next six months."**
- **"To see my article as the lead article of this magazine was one of the great thrills of my life. The complimentary remarks I received from my classmates and from my instructors and the satisfaction of a job well done compensated for the many hours I spent in preparing the manuscript."**

An instructor of the Civil Engineering Department said the following after he read the required reports:

"It was a pleasure to read students' reports that were logically organized, intelligently prepared, and accurately written. As a result, I was able to read the report more easily and to make significant comments about the content because I was not bogged down with misspelled words, ungrammatical constructions, and poor sentence structure."

Another stated:

"These reports have a 'professional air' about them. They are easily readable, correctly documented, and graphically illustrated. The style of the majority of these reports is mature."

A third instructor commented:

"Since the seniors have been taking the engineering writing course, I look forward to the reading of their reports. They are literate, relevant, and logical. Students show a mastery in writing, in research, and in the presentation of scientific and technical materials."

In the final phase of the course, students are encouraged to publish their own articles. Throughout the semester the various course assignments require students to read the many professional magazines and to familiarize themselves with the style, content, and format of the published articles. Also, the instructor discusses the advantages of writing for publication, namely, the pleasant satisfaction of accomplishment, the recognition by management and by one's associates, the greater possibility of advancement in one's position, the increase in one's professional status and prestige, and the broadening of the knowledge and the perception of the field in which he writes.

As to the specific preparation of an article for publication, students are taught to analyze the

various professional articles. They discuss the content, format, and length of these articles. They study the many kinds of opening and of concluding sentences and paragraphs; the logical organization of the material; the presentation of illustrations and graphs and the derivations of equations; and the style, the vocabulary, and the grammar. The instructor stresses the fact that the contents of the article should contain timely, important information of immediate practical usefulness and should be of wide interest to many engineers. Class discussions concern the handling of manuscripts by the editor—the review of the manuscript, the editing of the article, the submitting of the revised manuscript to the author for approval, the copyrights, the payment for articles, and the ordering of reprints.

A student whose article was published in a leading engineering journal said:

"To see my article as the lead article of this magazine was one of the great thrills in my life. I worked hard in preparing the manuscript, but the joy of seeing it in print, the complimentary comments that I received from my classmates and from my instructors, and the satisfaction of a job well done compensated for the many hours I spent in preparing the manuscript."

At the conclusion of the course, students wrote the following evaluations concerning their reactions to the semester's work:

"As one who found it difficult to bring myself around to writing anything, I found the assignments forcefully stimulated me into the writing process. The abstracts, bibliographical cards, and the reviews of masterpieces were good devices for encouraging the writer to write with quality for short spurts. All of the assignments were fine warmup exercises for the final report."

"I feel that the course was very effectively presented. I gained a store of knowledge and have gained confidence in my writing."

"Since taking this course, I have become very critical and aware of improving my writing. I also can detect poor style of writing in the newspapers. Before I took this course, it was difficult for me to write anything, but now I see that it can be done. You have instilled a confidence in me to write accurately and maturely."

"This course has taught me to write more effectively and to have confidence in my writing. In fact, as a result of this new faith in my ability to write, I have submitted a manuscript for publication and received a letter stating that it will be published within the next six months."